REMARKS

Claims 1-54 are pending in this application. Claims 1, 3, 10, 13, 43, 45 and 48 would be amended upon entry of this amendment. Support for the amendments to claims 1 and 45 may be found in original claim 3 and in the specification, for example on p. 9, line 21. Support for the amendments to claims 3 and 48 may be found in the specification, for example, on p. 21, line 17. Support for the amendments to claim 10 may also be found in the specification.

Regarding Examiner's Point 3. The Examiner rejected claims 1-54 under 35 U.S.C. 112, second paragraph. The Examiner indicated that the phrase "wool-like" in claims 1, 10 and 45 renders the scope unascertainable. The Examiner also indicated that the phrase "non-coil-like" in claim 10 renders the scope unascertainable.

The rejections are overcome by the amendments to claims 1, 10 and 45. The recitation of "wool-like" in claims 1 and 45 has been removed and replaced with –having a bulk density of from 3 kg/m^3 to 10 kg/m^3–. This recitation finds support in original claim 3, and does not represent new matter. "Wool-like" has also been removed from claims 13 and 43.

Claim 10 has been amended to remove the recitation of the non-sinusoidal and non-coil like configuration, and to remove the recitation of "wool-like". Applicant notes, however, that "wool-like" is a term of the art, as seen in McCullough, Jr. et al., U.S. Pat. 4,827,076.

Regarding Examiner's Point 4. The Examiner rejected claim 1 under 35 U.S.C. 102, as anticipated by McCullough, Jr et al. (U.S. Pat. 4,997,716).

Applicant believes that claim 1, as amended, is not anticipated by McCullough, Jr et al. '716 ("McCullough '716"). The carbon fibers in claim 1 are recited to be "anisotropic pitch-based" and "non-galvanic corrosive", and Applicant believes that neither is taught nor inherent in the composite structures described by McCullough '716. Moreover, the bulk density of the recited aggregate is 3 to 10 kg/m^3, a range which only partially intersects the broad range of 6.4 to 96 kg/m^3 described by McCullough '716 in col. 5, line 59. McCullough '716 does not appear to indicate individual bulk densities of the Examples in Table I, and thus no Example clearly teaches a value in the recited range.

Regarding the term "aniosotropic", this word appears in McCullough '716 only in col. 1, line 33, in reference to composite structures. There appears to be no teaching in McCullough '716 of the use of anisotropic pitch-based fibers. Likewise the term "pitch" does not seem to appear in McCullough '716. Thus, McCullough '716 does not appear to describe "anisotropic pitch-based fibers".

Applicant has attached an Inventor's Declaration relevant to this issue. As discussed below, this declaration indicates that the 6K tow of fibers used by McCullough '716 could not have been produced with pitch-based fibers having an average fiber diameter of 0.5-5 μm.

Applicant also notes that there appears to be no teaching in McCullough '716 of fibers which are "non-galvanic corrosive", and Applicant believes that this limitation is not taught by McCullough '716, and there is no indication that this property would be inherent. Applicant has also remarked, in the Amendment of July 26, 2000, that the property of galvanic corrosiveness is related to the ionization tendency of material constituting the fiber, and that this is not discussed in McCullough '716.

Applicant notes that, in the Examiner's "Response to Arguments" of the Final Office Action of 10/11/00, the Examiner referred to additional teachings of McCullough, U.S. Pat. Appl.

06/856,305, incorporated by reference in McCullough '716. The Examiner has not provided a copy of this reference, and does not designate the relevant portion of this Application, thus Applicant will refer to McCullough, Jr. et al., US 4,837,076, which apparently issued from this application.

Applicant notes that McCullough, Jr. et al. '076 discusses pitch-based fibers, but describes only one Example in which pitch may be used, and this is consistent with Applicant's arguments that non-pitch based fibers are used in McCullough '716. The '076 patent reference does not include the term "anisotropic". This patent also does not appear to use the terms "corrosion" or "galvanic". Applicant does not believe that McCullough Jr. et al. '076 teaches these limitations recited in claim 1.

Applicant therefore believes that these three limitations are not taught by, and that Claim 1 is not anticipated by McCullough, Jr. et al. '716, including the teachings of McCullough, Jr. et al. '076.

Regarding Examiner's Point 5. The Examiner rejected claims 2-54 under 35 U.S.C. 103(a) as unpatentable over McCullough, Jr. et al. (U.S. Pat. 4,997,716).

Applicant believes that claims 2-54, as amended by this amendment, are novel and non-obvious over the cited references.

First of all, with respect to claims 1-9 and 14-41, which depend ultimately from claim 1, McCullough '716 does not teach the limitations of "anisotropic pitch-based", "non-galvanic corrosive" and the recited bulk density range, as discussed above.

Applicant believes that the recited limitation of "anisotropic pitch-based" fibers is not suggested or motivated by McCullough '716. As noted above, no mention of "anisotropic" in regard to fibers appears in McCullough '716. McCullough, Jr. et al. '076 does discuss pitch-based fibers, but it appears that these are not the fibers used in McCullough '716. Applicant again notes Reference 1 in the Inventor's Declaration, which indicates, as discussed below, that McCullough '716's fibers

could not be "anisotropic pitch-based." Note also that McCullough '716 is not particularly clear what is the utility of the third group of carbonaceous fibers (see col. 5, line 2), which are the only fibers of carbon content greater than 85%, and there would seem to be no motivation in this reference for a further limitation on these fibers.

Likewise, the recited limitation of "non-galvanic corrosive" does not appear to be suggested in McCullough '716, or in McCullough, Jr. et al. '076. McCullough '716 discusses compositions which are lightweight, fire retardant, and radiation and fire shielding. There appears to be no mention of corrosion in either reference, and there would not appear to be a motivation for this limitation.

McCullough '716 describes a range of bulk densities of 6.4 to 96 kg/m^3, in col. 5, line 59, while claim 1 recites a range of 3.0 to 10 kg/m^3. McCullough '716 clearly does not suggest the portion of the recited range from 3.0 to 6.4, and the portion from 6.4 to 10 lies only at the bottom end of the range described. As McCullough '716 does not dislose the individual bulk densities of the Examples, it is impossible to determine which of the Examples might actually fall in the 6.4 to10 range, and thus it is unclear if any Examples actually has this limitation plus any of the other limitations of the claims.

Regarding claims 10-13, and 42-44, Applicant believes that the method of claim 10 is not taught, suggested nor motivated by McCullough '716. Applicant notes that McCullough '716 does not appear to specifically discuss the spinning method of the carbonaceous fibers used. Although McCullough, Jr. '076 discusses spinning generally, Applicant notes that claim 10 recites the use of anisotropic pitch, and the references lack of suggestion regarding anisotropic pitch-based fibers, and even specifically regarding pitch-based fibers, has been noted above.

Likewise, claim 10 recites a step of infusibilizing and carbonizing the carbon fibers which is not directly taught by McCullough '716. The recited temperature limitations are also not taught by this reference. The Examiner has implied that the McCullough Jr, et al. application 06/856,305

teaches carbonizing fibers between 600° and 700°, and that 600 to 1600°C is conventional. Applicant notes, however, that McCullough, Jr. '076, which is presumably equivalent to this application, does not use the term "infusiblizing" and the Examiner has not stated where infusibilizing is taught in this reference.

Claim 10 also recites a step of spraying and accumulating fibers which is not taught. In fact, McCullough '716 appears to teach away from this step in col. 5, lines 53 and ff., where it is stated:

> "Battings were made by blending an appropriate weight percent of each respective opened fiber in a blender/feed section of a sample size 12" Rando Webber Model B manufactured by Rando Machine Corp. of Macedon, N.Y. ...The battings were thermally bonded by passing the Rando batting on a conveyor belt through a thermal bonding oven at a temperature of about 300° F. The battings from part A were immediately taken and formed into panels by compression on a standard flat plate press at a pressure of 10,000 lb/ft^2 to form panels of 1/4" thickness."

This would appear to be quite a different method from that recited.

In addition, Applicant has attached the Inventor's declaration referred to above, which is relevant to claim 10. This Declaration illustrates that the carbonaceous fibers described in McCullough '716 could not have been made by the fiber manufacturing step of claim 10. That is, a 6K tow of fibers (as used in McCullough '716's conductivity definitions in col. 4, lines 53 and 59) cannot be produced with pitch-based fibers having an average fiber diameter of 0.5-5 μm.

McCullough, Jr. et al. '076 recites materials other than pitch-based which may be used in the invention (col. 3, lines 47-48). The only reference to "pitch" in the Examples in this reference appears to be in Example 4, which states: "In lieu of PANOX, there may be employed stabilized pitch based fibers or a copolymer or terpolymer of polyacrylonitrile." Thus, it would appear that McCullough '716 does not, in fact, use pitch-based fibers.

Regarding claims 45-53, claim 45 recites the limitations of "anisotropic pitch-based carbon fibers", the bulk density from 3.0 to 10 kg/m^3, and recites very specific galvanic characterization.

As noted above, there is no suggestion or motivation in McCullough '716 for the anisotropic pitch-based limitation. Also, as noted above, there is no suggestion or motivation for any limitation with regard to galvanic corrosion. Finally, as noted above, there is no suggestion nor motivation for the portion of the bulk density range from 3.0 to 6.4 kg/m^3, and a suggestion of the range from 6.4 to 10.0 is questionable.

Applicant therefore believes that claims 1-54 are novel and non-obvious over McCullough, Jr. et al. '716.

Reconsideration of the rejections is earnestly solicited.

Should the Examiner deem that any further action by Applicants would be desirable to place the application in better condition for allowance, the Examiner is encouraged to telephone Applicants' undersigned attorney.

In the event that the accompanying Petition for Extension of Time is not timely filed, Applicants hereby respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees which may be due with respect to this paper, may be charged to Deposit Account No. 01-2340.

Respectfully submitted,

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Attachment: Version with Markings to Show Changes Made
Inventor's Declaration

VERSIONS WITH MARKINGS TO SHOW CHANGES MADE

1. (Twice Amended) A thermal acoustic insulation material comprising:

a multiplicity of anisotropic pitch-based carbon fibers having an average fiber diameter of 0.5 μm to 5 μm and an average fiber length of 1 mm to 15 mm, said carbon fibers being non-galvanic corrosive and being bonded by a thermosetting resin at contact points of said carbon fibers so as to form a [wool-like] carbon fiber aggregate having a bulk density of from 3 kg/m^3 to 10 kg/m^3;

wherein said thermal-acoustic insulation material is non-galvanic corrosive.

3. (Twice Amended) A thermal-acoustic insulation material as in claim 1, [which has a bulk density of from 3 kg/m^3 to 10 kg/m^3] wherein said anisotropic pitch-based carbon fibers have an average fiber diameter of from 0.5 μm to 2.0 μm.

10. (Three Times Amended) A method of manufacturing a thermal-acoustic insulation material, comprising the steps of:

a spinning step of producing spun fibers by heating and melting anisotropic pitch obtained by polymerizing condensed polycyclic hydrocarbon, then discharging a melted matter out of a spinning nozzle and at the same time, blowing a heated gas from around the spinning nozzle in the same direction to which the melted matter is discharged;

a carbon fiber manufacturing step of manufacturing non-galvanic corrosive carbon fibers by infusibilizing spun fibers and thereafter carbonizing said carbon fibers at not lower than [550°C.] 650°C. but lower than [800°C.] 750°C.;

a spraying and accumulating step of accumulating said non-galvanic corrosive carbon fibers onto a plane so as to form a [wool-like] material, while spraying a thermosetting resin solution to said carbon fibers; and

a heat-forming step of forming said [wool-like] material of accumulated carbon fibers by applying heat so that contact points of said carbon fibers are bonded.

13. (Twice Amended) A method of manufacturing a thermal-acoustic insulation material as in claim 11, wherein said [wool-like] material of accumulated carbon fibers has a bulk density of 1.3 kg/m^3 or lower.

43. (Amended) A method of manufacturing a thermal-acoustic insulation material as in claim 12, wherein said [wool-like] material of accumulated carbon fibers has a bulk density of 1.3 kg/m^3 or lower.

45. (Three Times Amended) A thermal acoustic insulation material comprising:

a multiplicity of anisotropic pitch-based carbon fibers being bonded by a thermosetting resin at contact points of said carbon fibers so as to form a [wool-like] carbon fiber aggregate having a bulk density of from 3 kg/m^3 to 10 kg/m^3;

wherein said thermal-acoustic insulation material shows a galvanic current of 20 μA or lower in a galvanic cell having an electrode made of said thermal-acoustic insulation material, another electrode made of an aluminum plate, and an electrolytic solution [is] of 0.45 wt.% aqueous sodium chloride solution.

48. (Twice Amended) A thermal acoustic insulation material as in claim 47, [which has a bulk density of from 3 kg/m^3 to 10 kg/m^3] wherein said anisotropic pitch-based carbon fibers have an average fiber diameter of from 0.5 μm to 2.0 μm.